Present State of the Claims

1. (Original) A method for controlling a remote device, comprising:

defining a service-specific protocol to facilitate remote control of a service provided by the remote device;

sending data corresponding to the service provided by the remote device via a host-side software module running on a host computer in a format defined by the service-specific protocol from the host computer to the remote device over a network communication link;

sending control commands from the host computer to the remote device based on the service-specific protocol to cause the remote device to perform the service using the data that are sent to the remote device.

2. (Original) The method of claim 1, wherein the network communication link is established by:

connecting the host computer to a network to which at least one remote device is already connected;

obtaining an IP address for the host computer;

broadcasting a search message over the network requesting that any device meeting a search criteria defined by data contained in the search message to contact the host computer using the IP address for the host computer;

listening for a response to the search message, and in response thereto:

retrieving a description of a service provided by a remote device that responds to the search message to obtain a port number that may be used to communicate with the service; and

opening a TCP (transmission control protocol) socket that uses the port number.

3. (Original) The method of claim 1, wherein the remote device comprises a display device and the service-specific protocol defines display commands that are used to display content on the display device by sending display commands and data pertaining to the display content from the host computer to the remote device over the network communication link.

4. (Original) The method of claim 1, wherein the remote device comprises an audio device and the service protocol includes audio commands that are used to playback audio content on the audio device by sending audio commands and audio data pertaining to the audio content from the host computer to the audio device over the network communication link.

5. (Original) The method of claim 1, wherein the service provided by the remote device comprises an input service and the service-specific protocol comprises an input protocol defining a plurality of input primitives, further comprising:

listening for input data from the remote device, wherein the input data has a format corresponds to said plurality of input primitives; and

interpreting the input data to generate input commands based on the input protocol.

6. (Original) A method for enabling interaction between a remote device and a host computer, comprising:

discovering a service provided by the remote device;

establishing a network communication link between the remote device and the host computer;

launching a host-side software module to run on the host computer to enable interaction with the service via a service protocol that is specific to the service and a client-side component running on the remote device;

sending data corresponding to the service from the host computer to the remote device over the network communication link;

sending commands from the host computer to the remote device based on the service protocol; and

performing service operations corresponding to the service with the remote device that employ the data sent to the remote device and are performed in response to the commands received from the host computer.

7. (Original) The method of claim 6, wherein the remote device comprises a display device and the service protocol defines display commands that are used to display content on the display device by sending display commands and data pertaining to the display content from the host computer to the remote device over the network communication link.

8. (Original) The method of claim 6, wherein the remote device comprises an audio device and the service protocol includes audio commands that are used to playback audio content on the audio device by sending audio commands and audio data pertaining to the audio content from the host computer to the audio device over the network communication link.

9. (Original) The method of claim 6, wherein the service provided by the remote device comprises an input service and the service protocol includes input primitives to enable input data to be sent from the remote device to be interpreted by the host-side software module running on the host computer.

10. (Original) The method of claim 6, wherein establishing the network communication link comprises:

connecting the remote device to a network to which the host computer is already connected;

obtaining an IP address for the remote display device;

broadcasting information pertaining to the service provided by the remote device that includes a location from which a description of the service can be retrieved;

retrieving the description of the service to obtain a port number that may be used to communicate with the service; and

opening a TCP (transmission control protocol) socket that uses the port number.

11. (Original) The method of claim 10, wherein a DHCP (Dynamic host configuration protocol) host is connected to the network and obtaining an IP address comprise:

submitting a request from the remote device to the DHCP host for an IP address; and

allocating an IP address to the remote device via the DHCP host in response to the request.

12. (Original) The method of claim 10, wherein the remote display device obtains an IP address by performing the operations of:

automatically allocating itself an IP address selected from a pre-defined range of IP addresses;

verifying that the IP address that is automatically allocated is not used by any other device or host connected to the network, and

if the IP address is already in use, selecting another IP address and repeating the foregoing operations until a unique IP address for the network is obtained.

13. (Original) The method of claim 6, wherein establishing the network communication link comprises:

connecting the host computer to a network to which at least one remote device is already connected;

obtaining an IP address for the host computer;

broadcasting a search message over the network requesting that any device meeting a search criteria defined by data contained in the search message to contact the host computer using the IP address for the host computer;

retrieving a description of a service provided by a remote device that responded to the search message to obtain a port number that may be used to communicate with the service; and

opening a TCP (transmission control protocol) socket that uses the port number.

14. (Original) The method of claim 6, wherein discovering the service provided by the remote device comprises:

providing a network location from which a description of the service may be retrieved; and

retrieving the description of the service from the network location.

15. (Original) The method of claim 6, wherein the service protocol defines feedback primitives that are used to enable the remote device to send feedback data to the host computer.

16. (Original) A method for displaying content on a remote display device, comprising:

establishing a network communication link between the remote display device and a host computer;

determining display capabilities of the remote device;

sending display data corresponding to the display content from the host computer to the remote display device over the network communication link, said data having a format corresponding to display capabilities of the remote device;

sending display commands corresponding to a display service protocol indicating how the display data are to be displayed on the remote display device; and

displaying the display data on the remote display device in response to the display commands.

17. (Original) The method of claim 16, wherein the remote display device comprises a digital picture frame.

18. (Original) The method of claim 16, wherein the remote display device comprises a display adapter that provides signal to a television monitor.

19. (Original) The method of claim 16, wherein establishing the network communication link comprises:

connecting the remote display device to a network to which the host computer is already connected;

obtaining an IP address for the remote display device;

broadcasting information pertaining to at least one service provided by the remote display device that includes the IP address over the computer network; and

establishing a network communication link between the remote display device and the host of the remote display device that uses the IP address of the remote display device and an IP address previously assigned to the host computer.

20. (Original) The method of claim 16, wherein the display service protocol includes display synchronization commands that are sent to the remote device to enable the display content to refreshed in accordance with a predetermined timing to produce include synchronized animations.

21. (Original) The method of claim 16, wherein the display service protocol includes feedback primitives to enable the remote display device to provide display feedback information to the host computer.

22. (Original) A method for enabling a remote device to provide input to a host computer, comprising:

establishing a network communication link between the remote device and the host computer;

defining an input service protocol including a plurality of input primitives, each input primitive corresponding to a respective input event;

processing input events using an input service software module running on the remote device to produce input primitives corresponding to the input events;

sending the input primitives to the host computer; and

converting the input primitives into application inputs using a host-side input service module running on the host computer.

23. (Original) The method of claim 22, wherein the input events correspond to button activations resulting from a user pressing buttons on a remote control device linked in communication with the remote device.

24. (Original) The method of claim 22, wherein the input events correspond to keyboard button activations resulting from a user pressing buttons on a keyboard linked in communication with the remote device.

25. (Original) The method of claim 22, wherein the input events correspond to pointer device events resulting from a user activating a pointer device linked in communication with the remote device.

26. (Original) The method of claim 22, wherein the input primitives include a custom primitive that is used to pass raw input data received from an input device connected to the remote device to the host computer.

27. (Original) The method of claim 22, further comprising retrieving information corresponding to an input service provided by the remote device, said information including the primitives used by the input service.

28. (Original) The method of claim 27, wherein the information is stored in an XML (extended markup language) file that is retrieved by the host computer and parsed to determine the primitives used by the input service.

29. (Original) A method for enabling a remote device to provide input to a host computer, comprising:

establishing a network communication link between the remote device and the host computer;

defining an input service protocol including a plurality of verbal input commands, each input primitive corresponding to a respective input event;

in response to receiving verbal input at the remote device, generating digitized audio data corresponding to the verbal input commands;

sending the digitized audio data to the host computer via the network communication link;

processing the digitized audio data using speech recognition software running on the host computer to determine if the verbal input contains verbal input commands corresponding to the input service protocol; and

using such verbal input commands to control an action of the host computer.

30. (Original) The method of claim 29, further comprising storing the digitized audio data in a buffer on the remote device prior to sending it to host computer.

31. (Original) A machine-readable media on which a plurality of instructions are stored that when executed by the processor of a host computer perform the operations of:

interacting with a remote device to discover a service provided by the remote device;

interacting with the remote device to establish a network communication link between the remote device and the host computer;

sending data corresponding to the service from the host computer to the remote device over the network communication link;

sending commands from the host computer to the remote device over the network communication link based on a service protocol that is specific to the service provided by the remote device to cause the remote device to perform service operations specified by the commands that employ the data sent to the remote device.

32. (Original) The machine-readable media of claim 31, wherein establishing the network communication link comprises performing the operation of:

broadcasting a search message from the host computer over the network requesting that any device meeting a search criteria defined by data contained in the search message to contact the host computer using a network address assigned to the host computer;

retrieving a description of a service provided by a remote device that responds to the search message to obtain a port number that may be used to communicate with the service; and

opening a TCP (transmission control protocol) socket that uses the port number.

33. (Original) The machine-readable media of claim 31, wherein the remote device comprises a display device and the service protocol defines display commands that are used to display content on the display device by sending display commands and data pertaining to the display content from the host computer to the remote device over the network communication link.

34. (Original) The machine-readable media of claim 31, wherein the remote device comprises an audio device and the service protocol includes audio commands that are used to playback audio content on the audio device by sending audio commands and audio data pertaining to the audio content from the host computer to the audio device over the network communication link.

35. (Original) The machine-readable media of claim 31, wherein the service provided by the remote device comprises an input service and the service protocol includes input primitives to enable input data to be sent from the remote device to be interpreted by the host-side software module running on the host computer.

36. (Original) A device comprising:

a network interface;

a memory in which a plurality of machine instructions are stored comprising a set of client-side software to control a service provided by the device in response to service protocol specific data and commands received by the device having a format defined by a protocol specific to the service; and

a controller, coupled to the network interface and the memory, to execute said plurality of machine instructions to perform the operations of:

interacting with a remote host computer to establish a network communication link via the network interface with the remote host computer; and

in response to receiving service protocol specific data and commands that are pushed to the device from the remote host computer over the network communications link, performing service operations specified by the commands that employ the data.

37. (Original) The device of claim 36, wherein the network communication link is established by performing the operations of:

broadcasting device identification and service information identifying a service provided by the device and a communications port via which other devices connected to the network including the remote host computer may communicate with the device;

opening a TCP/IP socket via the communications port.

38. (Original) The device of claim 36, wherein the device further includes a display coupled to the controller, and the service provided by the device comprises a display service that is driven by display commands defined by the service specific protocol to

cause the device to display content on the display in response to receiving data and display commands from the remote host computer over the network communication link.

39. (Original) The device of claim 36, wherein the device comprises a display adapter that further includes an interface to couple to a display, and the service provided by the device comprises a display service that is driven by display commands defined by the service specific protocol to cause the device send display content to the display in response to receiving data and display commands from the remote host computer over the network communication link.

40. (Original) The device of claim 36, further comprising an audio driver coupled to the controller and speakers, and wherein the service specific protocol includes audio commands that are used to cause the device to playback audio content in response to receiving audio commands and audio data pertaining to the audio content from the remote host computer over the network communication link.

41. (Original) A device comprising:

a network interface;

a memory in which a plurality of machine instructions are stored including a set of client-side software to facilitate an input service provided by the device, said input service implemented through use of a input service protocol defining a set of input primitives;

an input signal processor to receive input signals from an input device; and

a controller, coupled to the network interface, the memory and the input signal processor, to execute said plurality of machine instructions to perform operations in combination with the input signal processor, including:

interacting with a remote host computer to establish a network communication link via the network interface with the remote host computer;

processing input signals received from an input device to generate input primitives corresponding to the input signals; and

sending the input primitives to the remote host computer via the network communication link.

42. (Original) The device of claim 41, wherein the input device comprises a keyboard.

43. (Original) The device of claim 41, wherein the input device comprises a pointer device.

44. (Original) The device of claim 41, wherein the input device comprises a remote control.